



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/731,879	12/09/2003	Tai Furuya	4466-032356	6702

7590 10/11/2006

Richard L. Byrne
WEBB ZIESENHEIM LOGSDON ORKIN & HANSON, P.C.
700 Koppers Building
436 Seventh Avenue
Pittsburgh, PA 15219-1818

EXAMINER

AMAYA, CARLOS DAVID

ART UNIT	PAPER NUMBER
----------	--------------

2836

DATE MAILED: 10/11/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

sf

Office Action Summary	Application No.		Applicant(s)	
	10/731,879		FURUYA ET AL.	
	Examiner		Art Unit	
	Carlos Amaya		2836	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 December 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 and 2 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 3-6 is/are allowed.
- 6) ☒ Claim(s) 1 is/are rejected.
- 7) ☒ Claim(s) 2 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 December 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>10/26/2004</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Drawings

1. The drawings are objected to because it appears that figure 1 reference numeral 49 should read "PLL". Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

- invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's admitted prior art in view of Spee (US 5,798,631) in further view of Underwood (US 6,411,065).

With respect to claim 1 Applicants admitted prior art discloses an interconnecting power generation system connected in parallel to a utility power system for supplying electrical power to an interconnecting load, comprising: an interconnecting inverter for linking generated electrical power to said utility power system; a voltage phase shift circuit which synchronizes the output voltage phase of said interconnecting inverter with the utility power voltage phase (page 1 of disclosure).

However, Applicant admitted prior art does not mention that it monitors zero crossings of said utility power voltage, and which, when a predetermined number of zero crossings have been detected, shifts said output voltage phase from said utility power voltage phase during one cycle and shifts the shifted output voltage phase to said utility power voltage phase during the following cycle; a circuit breaker for shutting off the output of said interconnecting inverter from said utility power system; a phase comparator for comparing the voltage phase of said utility power system and said output voltage phase of said interconnecting inverter; and an interconnection control unit which detects a power outage caused by an interruption of power supply from said utility power system based on a series of a predetermined number of matching signals outputted from said phase comparator and sends a control signal to said circuit breaker to shut off the output of said interconnecting inverter from said utility power system.

Spee discloses a variable speed generator (VSG) for generating or consuming energy, the system comprising a voltage zero-crossing detector and a PLL as shown in figure 8, for providing instantaneous information, in a periodic manner, on the frequency and phase of the grid voltages (Column 8 lines 6-11).

Underwood discloses a circuit breaker (contactor K1) for shutting off the output of said interconnecting inverter from said utility power system (as shown in the figures contactor K1 connects the an inverter 70 to a utility grid 99); a phase comparator for comparing the voltage phase of said utility power system and said output voltage phase of said interconnecting inverter (phase and sequence detector 97, and frequency synchronization work together with a PWM 225 to drive the inverter 70 in order to match the frequency of the utility grid with that of the inverter 70); and an interconnection control unit (controller 200) which detects a power outage caused by an interruption of power supply from said utility power system based on a series of a predetermined number of matching signals outputted from said phase comparator and sends a control signal to said circuit breaker to shut off the output of said interconnecting inverter from said utility power system (column 5 lines 26-48, as taught from Underwood once an outage is detected in the utility the contactors K1 are open).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have combined the teachings of Spee and Underwood with the admitted prior art of Applicant.

The suggestion or motivation for doing so would have been to have a reliable means of detecting a phase difference between power generation system and the utility

power system, also to have a safe and reliable means of connecting and disconnecting from the utility power when a failure in the power utility is detected.

Allowable Subject Matter

4. Claims 3 and 5 are allowable.

Claim 3 is allowable over the prior art of record, because the prior art does not disclose a "decrease in the rotational speed of said turbogenerator to a predetermined speed during the period between the detection of said power outage and the shutoff of said utility power system". Along with the rest of the claim.

Claim 5 is allowable over the prior art of record, because the prior art does not disclose that the interconnection control unit "sends a shutoff command to said turbogenerator to stop the operation of said turbogenerator after allowing the turbine to rotate at the rated rotational speed for a predetermined period of time". Along with the rest of the claim.

5. Claims 2 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

6. Claim 2 is allowable over the prior art of record, because the prior art of record does not disclose that "when no matching signal is outputted from said phase comparator within a period during which said output voltage phase is to be matched with said utility power voltage phase, said interconnection control unit detects variations in the frequency of said utility power system and sends a control signal to said circuit

Art Unit: 2836

breaker to shut off the output of said interconnecting inverter from said utility power system".


Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Carlos Amaya whose telephone number is (571) 272-8941. The examiner can normally be reached on M-F 8-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Sircus can be reached on (571)272-2800. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

CA


9-29-06

STEPHEN W. JACKSON
PRIMARY EXAMINER